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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/485,298	02/08/2000	JUNKO YAMAMOTO	1422-411P	1749

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EXAMINER	
KIM, YOUNG J	
ART UNIT	PAPER NUMBER
1637	

DATE MAILED: 08/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/485,298	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	Young J. Kim	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 5/19/04

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20,21,23,24,26-28,30,31,34,37 and 40-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20,21,23,24,26-28,30,31,34,37 and 40-43* is/are rejected.

7)☒ Claim(s) *42 and 43* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 19, 2004 has been entered.

Preliminary Remark

The Examiner of record has been changed. All further correspondence regarding this application should be directed to Examiner Young J. Kim whose Group Art Unit is 1637.

In response to the telephonic interview request made by Ms. Rupert, the examiner of record contacted Ms. Rupert for the interview, to which no correspondence could be made.

All objections/rejections hereto not reiterated should be considered withdrawn.

Drawings

No drawings have been filed for the instant application.

Abstract

The abstract of the disclosure is objected to because the abstract contains more than 150 words (approximately 210 words). Correction is required. See MPEP § 608.01(b).

Claim Objections

Claims 42 and 43 are objected to for the following reasons:

A series of singular dependent claims is permissible in which a *dependent claim refers to* ***a preceding claim*** which, in turn, refers to another preceding claim.

Claims 42 and 43 are dependent on subsequent claims. See MPEP § 608.01(n).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Auer et al. (Nucleic Acids Research, 1996, vol. 24, no. 24, pages 5021-5025).

Auer et al. disclose a method of selectively amplifying DNA sequences from cDNA, said method comprising the steps: i) generating a first strand cDNA from an RNA via reverse transcription reaction, wherein said reverse transcription reaction employs nucleotide analogs dUTP and dITP; ii) preparing a second strand cDNA from the generated first strand cDNA employing the same nucleotide analogs; and iii) amplifying the double stranded cDNA via use of the same nucleotide analogs to ensure that the

duplex formed between the newly generated cDNAs have a melting temperature well below that of the duplex formed between the genomic DNAs (page 5022, 1st column and 2nd column 1st and 2nd paragraph).

The amplification conducted by Auer et al. is a polymerase chain reaction.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 23, 24, 26, 27, 28, 30, 34, 37, 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auer et al. (Nucleic Acids Research, 1996, vol. 24, no. 24, pages 5021-5025) in view of Dodge et al. (U.S. Patent No. 5,912,117, issued June 15, 1999, 102(e) date, October 9, 1992) in light of Swanson.

Auer et al. disclose a method of selectively amplifying DNA sequences from cDNA, said method comprising the steps: i) generating a first strand cDNA from an RNA via reverse transcription reaction, wherein said reverse transcription reaction employs nucleotide analogs dUTP and dITP; ii) preparing a second strand cDNA from the generated first strand cDNA employing the same nucleotide analogs; and iii) amplifying the double stranded cDNA via use of the same nucleotide analogs to ensure that the duplex formed between the newly generated cDNAs have a melting temperature well below that of the duplex formed between the genomic DNAs (page 5022, 1st column and 2nd column 1st and 2nd paragraph).

The amplification conducted by Auer et al. is a polymerase chain reaction.

Auer et al. while conducting an RT-PCR method, are not explicit in the reagents employed in their method, particularly, the use of a compound which lowers the Tm (or melting temperature) of a double-stranded nucleic acid.

Auer et al. are also silent on the above compound being selected from the group consisting of formamide, dimethyl sulfoxide and trimethyl glycine.

While Auer et al. disclose all of the reagents comprised on instant claim 31, the disclosure of Auer et al. does not explicitly state that the reagents are comprised into a kit.

Dodge et al. evidences a well-known technique of employing DMSO in order to improve the sensitivity of PCR, wherein the inclusion of DMSO facilitates the denaturation of DNA duplexes (column 8, lines 49-61).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to modify the RT-PCR conditions of Auer et al. with the teachings of Dodge et al. for the following reasons.

The principle behind the method of Auer et al. is to allow selective amplification of RNA in the admix of DNA sequences comprising intron sequences by first synthesizing a first strand cDNA sequence from the RNA sequence via use of nucleotide analogs such that when said cDNA sequence is further amplified (as a template) with the incorporation of the same nucleotide analogs, the duplex formed between the complementary cDNA strands would have lower melting temperature than that of the duplex formed between the DNA which comprises introns. The method takes advantage of the lower melting temperature conferred to the produced cDNA duplexes, which

allows the dissociation of said cDNA duplexes at lower temperature than that of the DNA sequences comprising introns.

As the method involves the use of PCR, one of ordinary skill in the art would have easily recognized that addition of reagents such as DMSO, which facilitates the melting of nucleic acid duplexes by virtue of lowering their melting temperature (as evidenced by Swanson (page 2, 4th paragraph)) would have facilitated the melting of the cDNA duplexes in the selective amplification method of Auer et al.

One of ordinary skill in the art at the time the invention was made would have had a reasonable expectation of success as incorporation of formamides and DMSO in PCR reactions have been long established in the art as well as the recognition of their benefits (as evidenced by Swanson).

With regard to the kit comprising the ingredients, especially thermostable DNA polymerase and reverse transcriptase, the method conducted by Auer et al. is an RT-PCR reaction which would necessarily require the use of a thermostable DNA polymerase as well as the reverase transcriptase and it would have been further *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to package the reagent reagents of Auer et al. and Dodge et al. into a kit in view of the conventionality of kits in the analytical arts for the advantages of convenience, cost-effectiveness, matched and/or preweighed components, etc.

One of ordinary skill in the art would have had a reasonable expectation of success at packaging the reagents of Auer et al. and Dodget et al. into a kit as such practice is well-established in the art of analytical science.

Therefore, for the above reasons, the invention as claimed is *prima facie* obvious over the cited references.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Auer et al. (Nucleic Acids Research, 1996, vol. 24, no. 24, pages 5021-5025).

Auer et al. disclose a method of selectively amplifying DNA sequences from cDNA, said method comprising the steps: i) generating a first strand cDNA from an RNA via reverse transcription reaction, wherein said reverse transcription reaction employs nucleotide analogs dUTP and dITP; ii) preparing a second strand cDNA from the generated first strand cDNA employing the same nucleotide analogs; and iii) amplifying the double stranded cDNA via use of the same nucleotide analogs to ensure that the duplex formed between the newly generated cDNAs have a melting temperature well below that of the duplex formed between the genomic DNAs (page 5022, 1st column and 2nd column 1st and 2nd paragraph).

The amplification conducted by Auer et al. is a polymerase chain reaction.

While Auer et al. disclose all of the reagents comprised on instant claim 31, the disclosure of Auer et al. does not explicitly state that the reagents are comprised into a kit.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to package the reagent reagents of Auer et al. into a kit in view of the conventionality of kits in the analytical arts for the advantages of convenience, cost-effectiveness, matched and/or preweighed components, etc.

One of ordinary skill in the art would have had a reasonable expectation of success at packaging the reagents of Auer et al. into a kit as such practice is well-established in the art of analytical science.

Therefore, the invention as claimed is *prima facie* obvious over Auer et al.

Conclusion

No claims are allowed.

Inquiries

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Young J. Kim whose telephone number is (571) 272-0785. The Examiner can normally be reached from 8:30 a.m. to 6:00 p.m. Monday through Thursday. If attempts to reach the Examiner by telephone are unsuccessful, the Primary Examiner in charge of the prosecution, Dr. Kenneth Horlick, can be reached at (571) 272-0784. If the attempts to reach the above Examiners are unsuccessful, the Examiner's supervisor, Gary Benzion, can be reached at (571) 272-0782. Papers related to this application may be submitted to Art Unit 1637 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant does submit a paper by FAX, the original copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office. All official documents must be sent to the Official Tech Center Fax number: (703) 872-9306.

For Unofficial documents, faxes can be sent directly to the Examiner at (571) 273-0785. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1600.

Young J. Kim
Patent Examiner
Art Unit 1637
8/11/04

yjk